EXTENDED KEYBOARD

FIELD OF THE INVENTION

[0001] The present invention relates to electronic devices. In particular, the present invention relates to a novel and improved method for presenting an alphanumeric keyboard with an electronic device.

BACKGROUND OF THE INVENTION

[0002] In information technology, the user interface (UI) is everything designed into an information device with which a human being may interact, including display screen, keyboard, mouse, light pen, the appearance of a desktop, illuminated characters, help messages, and how an application program or a Web site invites interaction and responds to it.

[0003] Personal Digital Assistants (PDA) or other handheld electronic devices typically comprise a large display area in proportion to the size of the device. Most PDAs include only a few mechanical buttons in order to provide as large display area as possible. Therefore, the display area is also used as an input device. The display area is usually a touch screen so that information can be transferred into the device just by touching the display or using a special tool, e.g. a special pen.

[0004] A touch screen is a display screen that is sensitive to human touch, allowing a user to interact with the device by touching pictures or words on the screen. Touch screen technology can be used as an alternative user interface with applications that normally require a mouse, such as a Web browser. Some applications are designed specifically for touch screen technology, often having larger icons and links than the typical, e.g. PC application. There are basically three types of touch screen technology:

[0005] Resistive: A resistive touch screen panel is coated with a thin metallic electrically conductive and resistive layer that causes a change in the electrical current which is registered as a touch event and sent to the controller for processing.

[0006] Surface wave: Surface wave technology uses ultrasonic waves that pass over the touch screen panel. When the panel is touched, a portion of the wave is absorbed. This change in the ultrasonic waves registers the position of the touch event and sends this information to the controller for processing.

[0007] Capacitive: A capacitive touch screen panel is coated with a material that stores electrical charges. When the panel is touched, a small amount of charge is drawn to the point of contact. Circuits located at each corner of the panel measure the charge and send the information to the controller for processing. Capacitive touch screen panels must be touched with a finger unlike resistive and surface wave panels that can use fingers and stylus.

[0008] A touch screen can also be a touch-sensitive panel. U.S. Pat. No. 5,241,308 (Paragon Systems) describes a touch-sensitive panel for generating selected ones of any of a plurality of different signals, each of which is generated by touching a different location on the panel. The apparatus includes also force sensing means for sensing the magnitudes of the forces that are applied to each panel member support by the panel member when the member is touched at a selected location.

[0009] The user of an electronic device can be provided with various feedback signals. One form of feedback is haptic feedback. The reference publication WO01/54109 (Immersion) represents a solution of haptic feedback for touchpads and other touch controls. In the publication, a user uses a touch-input device for entering control instructions. Moreover, at least one actuator is coupled to the touch-input device and outputs a force to provide a haptic sensation to the user contacting the touch surface. In other words, the user receives feedback from the input device itself. The actuator is situated under the touch-sensitive display.

[0010] The problem is how to represent an alphanumeric keyboard with an electronic device of a limited size. Most touch screen devices represent the keyboard on the display one way or another. If the whole keyboard in essence is displayed with the device, the size of individual characters to be pressed is very small. Another way is to reorganise the keyboard, e.g. a QWERTY keyboard, and display it completely or partly at a time. However, the latter solution has the disadvantage that the familiar character pattern is broken down.

[0011] Another solution is to form a keyboard, e.g. QWERTY keyboard, completely outside the display area, e.g. as in Nokia 9210 Communicator. This, however, significantly increases the size of the device and, above all, decreases the size of an individual key.

[0012] The reference publication WO 94/22069 (Dynapro Technologies Inc.) represents a solution which enables the touch screen to be extended beyond the area of the display over which the touch screen is mounted. Touch-sensitive regions can thus be provided outside the display area. The purpose of the reference publication is to maximise the display area remaining for the output function. U.S. Pat. No. 4,827,410 (Corren) represents a similar solution where regions outside the display are used as input means.

SUMMARY OF THE INVENTION

[0013] The present invention describes a method and an electronic device where an alphanumeric keyboard is presented with the device. The alphanumeric keyboard is divided between the touch screen and touch-sensitive cover of the electronic device.

[0014] The division is done so that the alphanumeric keyboard is divided into two or more parts. The aim of the division is that the size of the alphanumeric keyboard would be sufficient for easy inputting of alphanumeric characters. One part of the alphanumeric keyboard is presented on the touch screen of the electronic device. The other parts of the alphanumeric keyboard are placed on the touch-sensitive cover of the electronic device outside the touch screen. The keyboard set on the touch screen can be changed so that a different set of characters, e.g. numeric characters are shown on the touch screen.

[0015] In one embodiment, the touch screen and the touch-sensitive cover features are enabled with an at least partially transparent touch-sensitive panel covering the actual display.